

TUBULAR ENERGY MANAGEMENT SYSTEM FOR
ABSORBING IMPACT ENERGY

ABSTRACT

An energy-absorbing system includes a tube made of a continuous material, such as
5 heat-treatable steel. The tube has first and second ring sections connected by an intermediate
section. In one aspect, the intermediate section is flared and/or pinched to cause one tube
section to predictably telescopingly roll upon impact. In another aspect, one section is
annealed to optimize elongation and yield properties to facilitate rolling upon impact. By this
arrangement, upon the bumper system receiving a longitudinal impact, the first and second
10 ring sections telescopingly collapse with a predictable and consistent rolling collapse. Methods
related to the above are also disclosed.